CLAIMS:

1   1.   An information processing system comprising:

2   first and second of levels of a storage hierarchy, wherein accessing information

3   in the first level consumes more energy than accessing information in the second level;

4   and

5   a processor for writing information to the second level of storage based on

6   energy-conserving criteria.

1   2.   The system of claim 1 wherein the energy-conserving criteria comprise a

2   collection of heuristics.

1   3.   The system of claim 1 wherein the energy-conserving criteria comprise system

2   state information.

1   4.   The system of claim 3 wherein the system comprises a storage input/output

2   subsystem and system state information comprises whether the storage input/output

3   subsystem is using one or more specific files.

1   5.   The system of claim 3 wherein the system state information comprises at least

2   one factor from among the following factors:

3   the storage input/output associated with one or more predetermined software

4   applications;

5   a sequence of storage input/output operations;

6   observed interactions with the first level of the storage hierarchy and wherein

7   the collection of heuristics infer the state of the second level of the storage hierarchy;

8   and

9   a type of energy source powering the system.

1   6.   The system of claim 1 further comprising a power source for the system and

2   wherein the system state information comprises information identifying the amount of

3   energy left in the power source when the system is disconnected from other sources of

4   energy.

1   7.   The system of claim 3 wherein the system stores current user profiles and the

2   system state information comprises whether storage input/output data are associated

3   with a current user profile.

1   8.   The system of claim 3 wherein the system stores current user preferences and

2   the system state information comprises whether storage input/output data are

3   associated with current user preferences.

1   9.   The system of claim 3 wherein the system state information comprises at least

2   one factor from among the following factors:

3   the storage input/output data associated with the characteristics of the

4   connection between the first and second levels of the storage hierarchy;

5   the storage input/output data associated with characteristics of the connection

6   between the system and at least one second level of the storage hierarchy;

7   the proximity of the storage input/output to events that change the state of the

8   at least one first level of the storage hierarchy;

9   the proximity of the storage input/output to a previous interaction with at least

10 one first level of storage hierarchy;

11   an indication of a hard-disk drive spin-down event; and

12   physical characteristics of the second levels of the storage hierarchy.

1   10. The system of claim 3 wherein the system state information comprises physical

2   characteristics of the second levels of the storage hierarchy.

1   11. The system of claim 1 wherein the second levels of the storage hierarchy are

2   implemented using Flash memory.

1   12. The system of claim 3 wherein the system state information comprises the

2   number of remaining write cycles.

1   13. The system of claim 1 wherein the processor is for removing information from

2   the second level of storage based on energy-conserving criteria.

1　14.　The system of claim 1 wherein writing information to the second level of storage

2　further comprises:

3　　　a mapping schema between cache files in the second level of storage and disk

4　files in the first level of storage, wherein each cache file is named with a logical

5　cluster number of its corresponding disk file.

1　15.　The system of claim 1comprising a hard disk drive comprising rotating

2　　　magnetic media comprising the first level storage and a cache comprising the

3　　　second level storage and an application-specific integrated circuit for managing

4　　　the cache according to the energy-conserving criteria.

1　15.　An information handling system, comprising:

2　　　first and second levels of storage, wherein accessing the first level of storage

3　uses more energy than accessing the second level of storage;

4　　　an energy use detector for determining the level of energy being used by the

5　system; and

6　　　an arbiter for writing information to second level storage when the energy use

7　detector determines that the system is being powered by a battery.

1　16.　An information handling system, comprising:

2　　　first level storage for storing information;

3　　　second level storage for storing information according to　a set of energy-

4　saving criteria;

5　　　a battery level detector for determining the level of charge in a battery; and

6   a controller for writing information to the second level of storage when the

7   battery level detector determines that the battery charge is below a pre-determined

8   threshold of charge.

1   17.   A method for managing storage of information in an information

2   processing system comprising two levels of storage wherein a first level is managed

3   and a second level is unmanaged wherein storing information in managed storage

4   consumes less system resources than storing information in unmanaged storage, the

5   method comprising:

6   monitoring the system to determine whether the operating state of the system

7   satisfies one or more energy-conserving criteria; and

8   storing information in managed storage when the operating state of the system

9   satisfies one or more energy-conserving criteria.

1   18.   A computer readable medium comprising program instructions for:

2   monitoring a system to determine whether the operating state of the system

3   satisfies one or more energy-conserving criteria; and

4   storing information in managed storage when the operating state of the system

5   satisfies one or more energy-conserving criteria.